PIGMENTATION

THE ROLE OF ANTIOXIDANTS IN VISIBLE LIGHT INDUCED PIGMENTATION

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Background: Visible light (VL) has multiple deleterious effects on the skin, including DNA damage mediated by oxidative stress and pigmentation in melanocompetent individuals. There are very few cosmetically acceptable sunscreens that protect against visible light.

Purpose: To investigate the role of topical and oral antioxidants in VL-induced hyperpigmentation

Methods: 29 subjects received topical pre-treatment with sunscreen containing inorganic and organic filters plus antioxidant (Topical SA), sunscreen containing inorganic filters (Topical S), and antioxidant alone (Topical A) prior to VL exposure. In a second study, pre-treatment VL responses were compared in 22 subjects to those following a 28-day course of oral antioxidant (Oral A). Assessments were performed immediately after, at 24 hours, and 7 days post-irradiation to assess pigmentation. Clinical photography, investigator's global assessment (IGA) scores for hyperpigmentation, diffuse reflectance, and skin biopsies were performed.

Results: Sites treated with Topical SA and Topical S showed decreases in IGA scores compared to controls, however, statistical significance was not reached. Spectroscopically, pigmentation was decreased following Topical S compared to controls ($p<0.05$). Topical SA reduced pigmentation only at the day 1 time point ($p<0.05$). Topical A was not effective against VL-induced hyperpigmentation. Oral A resulted in statistically significant decrease in PPD and DT responses as measured spectroscopically and a decrease in markers of oxidative damage and inflammation ($p<0.05$) post oral A.

Conclusion: Oral antioxidants have protective roles against VL-induced hyperpigmentation. Although Topical A was not effective in this study model, other topical antioxidants alone or

in combination may be effective against VL-induced hyperpigmentation.